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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/691,734	10/22/2003	In-Hwan Oh	24317/82301	7776

7590 11/29/2004
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EXAMINER

LAXTON, GARY L

ART UNIT	PAPER NUMBER
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2838

DATE MAILED: 11/29/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/691,734

Applicant(s)

OH, IN-HWAN

Examiner

Gary L. Laxton

Art Unit

2838

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 21 September 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-23 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-23 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 9/21/04.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

1. Applicant's arguments with respect to claims 1-20 have been considered but are moot in view of the new ground(s) of rejection necessitated by amendment.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1-3, 5-9 and 11-23 are rejected under 35 U.S.C. 102(b) as being anticipated by Lauw et al (US 5,559,685).

Claims 1, 20, 21 and 23; Lauw et al, figure 4, disclose a converter circuit, comprising: an AC-to-DC converter (20), comprising a plurality of first power devices (21-23); a resonant DC link (30), comprising at least one auxiliary power device (S_{C1} , S_{C2}); a DC-to-AC converter (10), comprising a plurality of second power devices (BH_1 - BH_3 , BL_1 - BL_3); and DC link lines (32, 35), coupling the AC-to-DC converter, the resonant link, and the DC-to-AC converter, wherein the auxiliary power device (S_{C1} , S_{C2}) is coupled between the DC link lines (see also abstract).

Claims 14-16; Divan discloses a resonant capacitor (C_C or C_S or C_R); a diode (D_C); and a switch (S_{C1} , S_{C2}); coupled between the DC link lines and parallel with each other.

Claims 17 and 22; figure 3 – (S_{C2}).

Claims 18 and 19; first capacitor (C_C), auxiliary power device (S_{C1} , S_{C2}), resonant capacitor (C_R), inductance (L_R), second capacitor (C_S).

4. Claims 4 and 10 are rejected under 35 U.S.C. 102(b) as being anticipated by Lauw et al (US 5,559,685) in view of Lee et al (US 5,633,793) .

Claims 4 and 10; Lauw et al discloses the claimed subject matter in regards to claims 3 and 9 supra except for the power transistors comprises a first power diode being coupled between a source and a drain of a MOSFET first power transistor.

Lee et al teaches that each bridge switch of a converter and rectifiers has an anti-parallel diode associated therewith; and it is understood that these anti-parallel diodes may be either discrete components or the body diode in the case of an active switch such as a MOSFET.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Lauw et al to incorporate power diodes coupled between a source and a drain of a MOSFET in order to utilize the current carrying characteristics of MOSFETs as switching devices and as suggested by Lee et al.

Conclusion

5. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

US 6,111,770 Peng discloses an auxiliary resonant DC tank converter with voltage clamping.

US 6,091,615 Inoshita et al discloses a resonant converter with a voltage clamp not in series with the DC link lines.

US 5,841,644 Lipo et al discloses a passively clamped quasi-resonant DC link converter.

US 5,617,308 Weise et al discloses a clamped resonant link inverter.

US 4,864,483 Divan discloses a resonant DC link converter with clamped voltage levels.

6. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Gary L. Laxton whose telephone number is (571) 272-2079. The examiner can normally be reached on Monday thru Thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Sherry can be reached on (571) 272-2084. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

 11/19/04
Gary L. Laxton
Patent Examiner
Art Unit 2838